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Dr. J. C. Warren

*Pres. of Association &
from his friends*

D. Hosce

A

DISCOURSE

ON THE

MEDICAL POLICE

OF THE

CITY OF NEW-YORK.

IN COMMON COUNCIL.

New-York, November 27th, 1820.

RESOLVED, That the Resident Physician be requested to furnish the Corporation with a copy of his Discourse, for publication, delivered on the sixth instant, relative to the means of improving the Medical Police of this City, for the prevention of Diseases.

Extract from the Minutes,

J. L. MORTON,

Clerk, pro tem.

4

OBSERVATIONS
ON
FEBRILE CONTAGION,
AND ON THE MEANS OF
IMPROVING THE MEDICAL POLICE
OF THE
CITY OF NEW-YORK.

DELIVERED AS AN INTRODUCTORY DISCOURSE,

IN THE

HALL OF THE COLLEGE OF PHYSICIANS AND SURGEONS, ON THE SIXTH
OF NOVEMBER, 1820.

BY

DAVID HOSACK, M. D.

Resident Physician for the City of New-York; Professor of the Institutes
and Practice of Medicine in the University, &c.

NEW-YORK:

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1820.

OBSERVATIONS,

&c.



GENTLEMEN,

WE have just passed through a season that has been peculiarly distressing to several cities of the union, by the visitation of the yellow fever; while the city of New-York has enjoyed a perfect exemption from that disease.

The circumstances connected with these events have led me to make some general remarks on this subject, and to invite the attention of my fellow citizens, as well as the members of the Common Council, the Board of Health*, and my professional brethren, to the deductions that must necessarily arise from the facts which the experience of the present year, in connexion with the past, has disclosed.

To you, young gentlemen, some of whom are just entering upon the study of medicine, while others of you have already directed your inquiries to the investigation of medical truth, this subject cannot be without interest. Under this impression, I invite

* This Discourse was delivered before the medical students of the University, and was honoured by the presence of many of the members of the Common Council and Board of Health.

your attention to some general remarks on febrile contagion, and shall conclude by pointing out the means calculated to promote the health of the city; and which, in conjunction with the excellent quarantine regulations of this state, may secure us from future visitations of yellow fever, and other contagious diseases, usually propagated through the medium of an impure atmosphere.

You are doubtless aware of the opposite opinions which have divided the physicians of the United States relative to the contagious nature of yellow fever, and of the controversies to which that question has given birth, relative to the domestic origin or foreign source of that disease. The same diversity of opinion, though in a less degree, exists among the physicians of the West Indies, and of Europe; and, latterly, in this country, the same question has been agitated relative to the contagiousness of dysentery, the various forms of typhus, jail, ship, or hospital fever, and has been extended even to the plague itself: each too contends that his opinion is legitimately deduced from facts. Paradoxical as it may seem, this is truly the case; they are both right, and each reasons correctly from the premises he assumes: for example, he who contends that the yellow fever is contagious, under all circumstances, in the pure air of the country, as well as in the foul air of the city, certainly contradicts the facts which repeated observations has established. On the other hand, he who

denies its contagiousness in a foul atmosphere, in the confined and crowded dwellings of the poor, in the impure air of our cities, in the vicinity of the water side, where the materials producing such impurities are most abundant, no less violates the truth. To reconcile these opposing opinions, and to explain those contradictory results, has been, for many years past, the object of my attention.

I began the inquiry by asking the question, what is a contagious disease? To this question I found no answer had been given, in which physicians were united. Many had been proposed according to the particular disease each had happened to select as the standard of comparison; for example, the small-pox was by some made the standard. This disease is communicated by contact, by the air, and can be contracted but once in the course of life. Yellow fever, and many other febrile diseases, usually deemed contagious, referred to this as the exemplar, are certainly not contagious diseases; but those who reason thus, and deny the contagious nature of yellow fever and plague, because they may be taken more than once, forget that there are also diseases, on all hands admitted to be contagious, which can be repeatedly contracted by the same person, as the itch and the venereal disease. Driven from this ground as untenable, a distinction was resorted to, that some diseases are contagious and others infectious. What then, I ask, is an infectious disease, as distinguished

from one that is contagious? An infectious disease, they allege, is not derived from the sick body itself, but from the foul air in which the sick person happens to be lodged: but they have never told us how it happens that the foul air surrounding the sick, always possesses the wonderful property of communicating, not invariably the same disease, as would be expected if proceeding from foul air alone, but precisely that disease under which the patient happens at that time to labour. Is he sick with yellow fever?—the by-stander gets yellow fever. Is he ill of dysentery?—dysentery is in like manner communicated: therefore, I contend, that the disease, as well as the atmosphere surrounding the sick, has something to do in the communication of the disorder in question, but which has been strangely and totally overlooked by almost every writer on this subject.

In July, 1808*, in a communication addressed to Dr. Chisholm, I proposed to narrow the ground of controversy by considering all those diseases, usually deemed communicable from man to man, whether contagious, or infectious, whether examples of specific or general contagion, under one great head; and in that view, totally disregarding the peculiarities of each, or the manner in which the poisonous effluvia communicated the disease, whether by contact, by the air, by clothing, or other substances imbued with the excre-

* American Medical and Philosophical Register, vol. ii. p. 14.

tions of the sick. Upon further survey of those diseases, it soon became manifest that there were no two of them in which all the laws of communication corresponded, and in which they agreed in all the circumstances of their operation upon the system. I then proceeded to a subdivision of this great family of diseases. In making this distribution it was found that some were exclusively communicated by contact, as syphilis, hydrophobia, and the vaccine virus; others by the air and by contact, as the small-pox and measles; while other diseases, of a third description, are only communicable through the medium of an impure atmosphere, as typhus, yellow fever, dysentery, and the plague; while the same diseases, with due attention to ventilation, personal cleanliness, and the removal of every thing offensive from the apartments of the sick, are rarely, if ever, propagated beyond the individual first affected.

This new arrangement and the modified or conditional contagiousness of fever as flowing from it, I hope it will not be deemed vanity to observe, have been received with approbation by many distinguished practical physicians in Europe, as well as in this country, and have been considered as affording a satisfactory solution of many of the difficulties with which this subject has been embarrassed*. Latterly,

* See London Annual Medical Review, Edinburgh Medical and Surgical Journal, London Annals of Medicine and Surgery, The Saltburgh Journal, by Albers of Bremen.

however, the distribution proposed, and the principles connected with it, have been called in question by some of the medical gentlemen of this country, who, it appears, have not yet had an opportunity, either from reading or practical observation, of knowing the facts from whence the deductions had been made to which I have referred. They have, from the want of this knowledge, precipitately run into the absolute and unqualified disbelief, not only of the correctness of the view taken of this subject, but of the contagiousness of the fevers enumerated under any circumstances. They have, indeed, considered the very existence of contagion, as appertaining to fevers, a mere phantom of the imagination. To those gentlemen I observe, in the language of an able writer in the *Edinburgh Review*, that "In the present state of medical knowledge, it is not at all more absurd to deny the existence of fever altogether, than to maintain that it is not propagated by contagion." I furthermore ask, are the unfledged opinions and speculations of those men of the closet, who yet have had but few opportunities to test them at the bed-side, to come in competition with the results of experience, aided by the most profound professional learning, and the distinguished abilities of the numerous writers who have adorned the past, and many of whom still continue to enlighten the present age? Are the investigations and the accumulated experience of Huxham, Haygarth, Currie, Gre-

gory, Ferriar, Percival, Blane, Chisholm, M^cGregor, Pym, Gilpin, Wright, and a host of others, to be prostrated by the arrogant assertions, the overweening conceits, and flippant remarks of those juniors in knowledge and in years, who have lately obtruded themselves upon the public attention? Although they do not merit a serious and laboured refutation of their mistaken views, it will be at least proper, under the various points which they consider at issue, to call their attention to those important facts, and those sources of information, with which they appear to be unacquainted, or which, in their eagerness to promulgate their effusions, they have totally disregarded. With this view, I shall notice their lucubrations under the several heads in which they dissent from the truths that appear to have been established by the experience and observation of the distinguished physicians to whom I have already referred.

In the first place, they deny the peculiar character of yellow fever as distinct from the ordinary bilious and typhus fevers of our country, considering them all as grades of the same disease.

It gives me pain to remark, that some late writers in Boston, Baltimore, Philadelphia, and in this city, to the disgrace of the medical character of this country, and evincing a total ignorance of the diagnostics of disease, have identified the yellow fever of the tropics with the common bilious fever, our ordinary endemic, and which. indeed, occasionally appears at all seasons

of the year; for this latter form of fever I have known to exist, and have prescribed for, not only in the spring, summer, and autumn, but in midwinter, when the earth was covered with snow, and there was a total absence of all those circumstances of heat, moisture, and miasmata, which these very writers contend are necessary to the production of yellow fever. In confirmation of this fact, and of the errors to which this unitarian doctrine leads its votaries, I observe that within a few days, and since the appearance of frost, which they unanimously admit at once extinguishes the more fatal form of yellow fever, some of their deluded followers have gravely reported to our Board of Health, as cases of yellow fever, the ordinary examples of a bilious remittent!—Uninstructed in the distinctions of fever, it is not matter of surprise that they can thus intermingle names and things. From this dilemma they have no escape: but their absurdities are not limited to this example—a late pamphleteer has gone so far as to confound the yellow fever with the common bowel complaints of children, proceeding from heat and dentition.

I cannot consent seriously to notice this daring assertion, made by those who acknowledge no distinction between one form of fever and another, and who can confound the effects of heat alone with the other causes of disease, and which I had almost said the youngest pupil in my hearing knows to be at variance with fact.

When the writers referred to shall have attentively perused the pages of Lind, Pringle, Blane, Lempriere, Niell, and Pym, who have most abundantly drawn the distinguishing characters of bilious and yellow fever, and whose diagnostics are derived from the bedside of the sick, not the abstract productions of the writing desk, they will wish that the publications to which they have affixed their names, had never seen the light. Indeed, as it regards their knowledge of yellow fever, I feel constrained to remark, that it would almost appear that one of the great qualifications of those gentlemen is to be practically unacquainted with the disease on which they write; and, as in viewing certain objects, it is necessary for the observer, for the purpose of more distinct vision, to withdraw to a considerable distance from the object to be inspected, they, in like manner, have considered it equally proper to take a distant view of the epidemic they are to describe. Such I allege has been the fact, that the greater number of those who have written most, and in the most dogmatic style, not only in the earlier years, when yellow fever visited our shores, but in the later seasons of its appearance, have immediately upon the commencement of the disease, fled to a distance from the scene of distress:—but what they want in facts they supply by bold assertion, and for dispassionate reasoning they substitute the coarsest personalities.

This observation is not exclusively confined to the late writers who have appeared in the United States ; it is no less applicable, in all its extent, to the intemperate effusions of a transatlantic author of some notoriety—I refer to the pages of Dr. Edward Nathaniel Bancroft.* That physician, it appears, has still to learn the elementary truths relative to the limited and slow progress of contagion as applied to fever, and which have been known from the days of Lucretius, and have been confirmed by Lind, Haygarth, and every writer who has treated of the typhus fever of Great Britain during the last fifty years ; otherwise Dr. Bancroft certainly could not have committed the gross error he has done in his inference, that because the yellow fever which prevailed in this city was generally circumscribed to a particular part of the town, that therefore the disease was of domestic origin, and not contagious ; forsooth, that because it did not diffuse itself as an epidemic small-pox, measles, or scarlatina, that therefore it was not a contagious disease : he might with equal propriety have drawn the sapient conclusion that yellow fever is not small-pox.

On the contrary, I contend, that as the yellow fever did not simultaneously appear in different parts of the town, but successively, beginning at the water side, in the immediate vicinity of a tainted ship ; and as in all the subsequent cases they were traced by

* See his Essay on Yellow Fever.

the Board of Health to the place of its first appearance, the inference is certainly adverse to the domestic origin of the disease, and in favour of its introduction from abroad. I know not what is truth or correct reasoning, if any other deduction is admissible from the premises that have been stated.

Secondly,—They deny the contagious character of yellow fever. Here too they come in conflict with the experience and observation of men who are the most distinguished of our profession, and have devoted their lives to the investigation of subjects of this nature.

To enumerate the names of those who have borne witness to the contagiousness of yellow fever in the West Indies, in South America, in the southern parts of Europe, and in this country, would be a trespass on your patience. I must, however, state, that until the facts on this subject, which have been adduced by Sir Gilbert Blane, in his well known work, his *Diseases of Seamen*, and the body of evidence contained in the celebrated production of his later years, his *Elements of Medical Logic*, shall be disproved—until the affirmative testimony contained in the writings of Dr. Chisholm, Dr. Wright, Sir James M'Gregor, Dr. Pym, and Sir Joseph Gilpin, whose connexion with the army and navy, and their long residence in hot climates, have peculiarly qualified them to form a correct judgment on this subject, shall be disproved, the negative declarations of the

late writers to whom I have referred must be discredited.

But I oppose to the assertions of those gentlemen, denying the contagious character of yellow fever, the publications of the College of Physicians of Philadelphia, which contain a detail of facts of the communication of this disease in the vicinity of that city, attested by the late Dr. Wistar, and corroborated by the additional observations and evidence of the venerable Kuhn, Shippen, Griffitts, and others; testimony which cannot be invalidated without impeaching the moral character of those honourable men, a species of argument which it is to be deplored has not in every instance been abstained from by the partizans of this question. I also call their attention to, and challenge their refutation of, the facts relating to the communication of this disease on Staten-Island, as recorded by Dr. Richard Channing Moore, the present Bishop of Virginia---to the introduction and spread of yellow fever at Brooklyn, at the Wallabout, and at Huntingdon, on Long-Island, and at Perth Amboy—all which they will find minutely detailed in a periodical publication of this city,* and which, in connexion with the evidence already mentioned, present a mass of testimony as permanent as truth itself.†

* American Medical and Philosophical Register, vol. i. p. 101, 256—vol. ii. p. 23—vol. iii. p. 191.

† When Dr. Irvine, of Charleston, shall have perused the facts here referred to, I trust, as a gentleman of candour, he will retract his assertion.

In the language of Sir Gilbert Blane, "the question seems now to be brought to such a point, that we may venture to challenge any candid, intelligent, and unbiassed man, whether in or out of the profession, to open his eyes, and deny that this disease is contagious; and if it be not, then has the author of this discussion lost every faculty of distinguishing truth from falsehood, of discerning light from darkness."

But it has been alleged, that upon this subject they will not permit their fellow citizens to be the judges. The public are not competent to decide, says a late writer; they are an umpire of prejudice and ignorance, and by such an appeal to public opinion, physicians compromise the rank and dignity of science and of their profession. Without impeaching the motives of the author of these sentiments, or however humiliating it may be to the lofty feelings he professes, I believe it will be considered as a truth, that persons of the plainest understandings oftentimes form sounder judgments on important points, than those who value themselves on their scientific or their professional attainments. "But this is a point," says an eminent scholar and physician,* speaking of the evidence re-

that "the cases of yellow fever carried into the country, have always terminated with the individuals who have so conveyed it." He will also withdraw the approbation he has given to the equally unfounded and similar asseverations of Dr. Bancroft, who appears to be no less a stranger to the truth.

* Sir Gilbert Blane.

lating to the contagiousness of fever, and the communication of it from one country to another, "to which any man of good sense and understanding is competent, as it hangs upon matters to be decided on by the rules of evidence not involving professional knowledge." "Nor on the subject at issue," he adds, "will the experience and common sense of mankind surrender themselves to any profusion of bewildering words, however confidently and imposingly pronounced."

Another ornament of our profession and of literature, the late Dr. Currie, of Liverpool, and one quite as competent to judge on this matter as the writer who deplores the humiliation of his brethren in referring the subject in dispute to a public tribunal, thus expresses himself:---"It is folly to pretend that this subject is of a professional nature, and not cognizable by any fair understanding. The facts are numerous, the inference easy. It is only necessary for unprejudiced men to make themselves masters of the first—the last seems inevitable." I must be indulged in a reference to another writer, to whose opinion still greater value must be attached by the adversaries of the doctrine of contagion, as he has lately become and been acknowledged their champion.

"The subject of epidemic diseases," says Dr. Charles Maclean, (who is not a little annoyed that he has to defend his dogmas against the whole College of Physicians of London,) "is universally admitted

to be of very extraordinary interest and importance, not to this nation only, but to every individual of the human race. It is also not disputed, for it is acknowledged even by Dr. Patrick Russell, the principal founder of the Quarantine regulations of 1800, and a person reputed in such matters of very high authority, that the question of contagion in epidemic diseases is entirely one of fact, not of physic. It is consequently a question, of which all persons of equal education and understanding are as competent to judge as physicians, or even more so, in proportion as their minds may be more free from preconceived notions or false knowledge respecting it.”*

Thirdly,—Disbelieving the contagiousness of yellow fever, they reject the doctrine of its importation.

When we attend to the facts, that the yellow fever in the United States and in the south of Europe, has never shown itself in the interior of the country, out of the reach of the tide waters;—that it has never made its appearance in any of the seaports, but as immediately connected with, and consequent upon, the arrival of vessels from the tropics, either tainted by disease having had sick on board, or coming from ports where the disease had previously prevailed—when the pestilential fever thus introduced, has been limited to the very vicinity of those vessels, and to those persons di-

* *Specimens of Systematic Misrule, &c.* by Charles Maclean, M. D.—London, 1820—p. 154.

rectly or indirectly holding communication with them, as has been remarkably evinced in every year of its prevalence in our cities—under these circumstances, we have the strongest presumptive evidence of the importation of such disease.

But when we furthermore advert to the testimony on this subject, where the introduction and progress of the disease has been particularly traced and detailed in the south of Europe and in the United States, the mind is overwhelmed by the facts that are presented. But, lest I should be charged with replying to assertions by assertions, I beg leave, for the information of those who disbelieve the introduction of fever from abroad, to refer them merely to some of the most recent evidence that has been adduced upon this subject—for a volume would not contain the proofs in my possession, of its conveyance from port to port, from ship to ship, since the commencement of commerce and war between the northern nations and those of the tropics. Passing over, too, the facts which have been disclosed by the observations of Dr. Linning,* of Charleston; Dr. Mitchell,† of Virginia; Dr. Chisholm‡; Dr. Dancer,§ of Jamaica; Dr. Stewart,||

* Edinburgh Physical and Literary Essays, vol. ii.

† American Medical and Philosophical Register, vol. iv. p. 181.

‡ Essay on the Malignant Pestilential Fever; also his Letter to Dr. Haygarth.

§ Jamaica Medical Assistant; and various papers in the Med. Repository.

|| American Medical and Philosophical Register, vol. iii. p. 183.

of Grenada, and others, I shall only refer to the introduction and propagation of the disease in question, since the year 1800, in Cadiz, Malaga, Gibraltar, Carthagera, Alicant, and Leghorn, as illustrated in the very able report of Dr. Arejula, of Madrid, and the commissioners appointed by the French government to investigate its origin and character ; and who have described its spread in those places, from house to house in succession, and to some of the neighbouring villages holding communication with them.— Their statements alone contain irrefragable testimony on this point ; for in those very years of its prevalence in the places enumerated, it was not known ever to have made its appearance either in rural districts, or in any inland uncommercial towns, such as Rome, Naples, Palermo, or others lying in those latitudes.

“ Is it conceivable,” says an eminent writer,* “ that a disease totally different from any till then known in the memory of man, by tradition or history, should, in the course of seventy years, as at Cadiz, make its appearance six times, at unequal intervals, and in no other spot in Europe, except once at Malaga, unless from a foreign cause ?” Again he asks, “ is it conceivable that, during the hundred years that Gibraltar had been in possession of the English, that is, from the year 1704, when this fortress was taken by the army under the command of the Prince of Hesse, to

* Sir Gilbert Blane. See Elements of Medical Logic, p. 150.

the year 1804, in which this pestilential fever for the first time broke out, this disease should never once have showed itself, if it depended on causes at all times existing and present?"*

When the circumstances of this arid rock (and the same may be said of Cadiz, the whole surface of which is either rock or sand) are taken into consideration, can such disease, with the shadow of truth, be referred to the exhalations of the soil? when, too, it is well known, that at the very time those pestilential epidemics raged in Cadiz and Gibraltar, the marshy districts in the vicinity, as well as the whole adjacent country, were entirely free from them, the appeal is unanswerably made, can a proposition more extravagant, more repugnant to reason, more irreconcilable to history and analogy, fall from the pen or mouth of man, than that which would ascribe such disease to domestic sources?†

But, to return to the proofs adduced in our own country, I appeal to the facts recorded by Dr. Munson, senior, of the introduction of yellow fever into New-Haven, in 1794,‡—into Providence, Rhode-Island, in 1805, as described by Dr. Pardon Bowen,§—its introduction into the city of Perth Amboy, in 1811,|| when it was acknowledged by all to have

* Blane, p. 150.

† See also Blane's *Elements of Logic*, p. 151.

‡ Transactions of the College of Physicians of Philadelphia.

§ American Medical and Philosophical Register, vol. iv. p. 331.

|| Ibid. vol. iii. p. 94.

been introduced, and under circumstances that carried conviction to the most obstinately incredulous; and which the journals of Edinburgh and London pronounced to be unanswerable testimony on this point. I also appeal to the evidence of a similar communication of the same fever to the neighbouring town of Brooklyn, Long-Island, in 1809,* when our own city, only 800 yards distant, enjoyed the most perfect health; and I add its introduction into the proverbially healthy village of Middletown, in the present year, as demonstrated in the able communication made to the Board of Health, by Dr. Beck, of this city.† In like manner, the proofs are preparing to show the importation of the same disease into Providence (Rhode-Island), Philadelphia, Charleston, Savannah, and New-Orleans, where the fever has prevailed during the present year. Seeing too, that the city of New-York has experienced, during the past season, a degree of heat almost unprecedented; that we have participated in the same constitution of atmosphere that has so extensively affected this continent,—I ask, to what cause are we indebted for the happy exemption of this city from the same ills with which our southern and eastern states have been afflicted? I answer, to our excellent system of Quarantine Laws, and the faithful execution of them by an able and vigilant Health Officer.

* American Medical and Philosophical Register, vol. i. p. 101, 256.

† See Appendix A.

Before I conclude my remarks on this head, allow me to state another fact, that at once vanquishes the speculations of the adversary of the doctrine now inculcated,—That during the years in which our commerce with the West Indies was interdicted by the embargo, and during the subsequent years of war with Great Britain, when our communication with her possessions in those climates and countries, the usual seat of fevers of this description, was altogether suspended, the cities and towns along the whole of our seaboard were totally exempt from the fever of the tropics.

A recurrence too, to the meteorological observations of that period, will show a thermometrical range frequently higher than in those years when the yellow fever prevailed in our cities;* the rain too fell as in ordinary seasons, and, judging from the prevalent diseases, a general constitution of atmosphere favourable to the generation of this malignant form of fever, if domestic causes could engender it, pervaded our country as heretofore; the local circumstances of our seaports were the same, nay worse, for they were crowded with shipping; the new-made ground remained unchanged in its condition; the same offensive vapours arose from our slips, our market-places, our privies, and from the soil where the latter did not exist†—yet, unfortunately for the doctrine of the be-

* Appendix B.

† See Medical Repository, in which the Editors ascribe the same disease in one year to privies, and in another to the want of privies!

lievers and supporters of the domestic origin of yellow fever, the health of our cities remained undisturbed by the deadly visitor.

For the conviction of the honest mind, further remarks on this head are superfluous—those who are wedded to a contrary belief, and who wrap themselves up in the pride of abstract opinions, “angels trumpet-tongued” would fail to convince of their error.

It is an unavoidable inference, from the view taken of the importation of fever, that nothing short of the most rigid system of Quarantine Laws, and those too, executed by officers who conscientiously believe in their utility, will secure our cities from a repetition of the evils we have experienced. Nor can our country be effectually guarded against the renewal of yellow fever in our seaports, while our commerce continues with the torrid zone, unless the government of the United States shall, as has been done in Great Britain, institute a general system of Quarantine regulations, to be strictly enforced in every commercial city of the union. When, too, we take into view the late progress of the plague, and call to mind the introduction of that disease, in former days, into the cities of London, Marseilles, and Moscow, have we not reason to expect that our commerce with the Levant will, ere long, add another scourge to our country, unless we are protected by a code of health laws, to be alike operative in all our seaports?

As far as thirty years personal acquaintance with yellow fever has enabled me to form a correct opinion on this subject, I venture to predict, that nothing short of some such preventive regulations will secure us from the evils of pestilence, and that experience will ultimately induce the general government to legislate on this subject.

Fourthly,—They contend for the domestic origin of the yellow fever, ascribing it to a high degree of temperature combined with moisture—to the exhalations arising from the decomposition of animal and vegetable substances, and to other circumstances, of the precise nature of which they candidly confess their ignorance. In their enumeration of the various sources from whence they derive this disease, much stress has been laid upon the subject of new-made ground, and the materials buried beneath the mass of sand that constitutes its covering. I ask, are not the greater part of the streets that skirt the two sides of the city, and particularly the western side, for some hundred yards from the margin of the waters that wash their shores, composed of new-made ground? and has the yellow fever ever appeared on the west side of the city, except in a single season, when the disease had previously appeared in the same season on the eastern side, and the infected shipping had been removed from thence to the west side of the town?—I answer, from my own personal knowledge, that in no other instance has the disease ever appear-

ed on our western shore;—and in that memorable year in which it was so conveyed by the removal of the shipping from the east to the west side, this result was predicted; and, through the medium of the papers, Mr. Livingston, then the Mayor, and President of the Board of Health, was called upon in order to prevent the measure from being carried into effect. This prediction was disregarded; and the result is well known, that for the first and only time the western side of the city became the seat of yellow fever.

This fact of itself, furnishes conclusive evidence on this head of the innocence of new-made ground as a source of fever. Comparing the present map of the city with one in my possession drawn fifty years ago, it will be found, that the new-made ground is not limited to the parts of the town bordering the rivers, but that some hundreds of acres in the very heart of the city, that were formerly swamps and morasses, have been in like manner filled up, and that too within the remembrance of many of the present inhabitants of the city. I ask, has the fever made its appearance in those interior parts of the town? and are they not more healthy in their present, than they were in their past condition, previous to their being so filled up?—I trust a reply is not necessary:—another fact, that cannot fail to silence the sophist on this hackneyed theme, and show the absurdity of resorting to putrid materials, buried beneath the surface of the earth, as the source of our fevers, is the proverbial healthi-

ness of all those parts of the city that are in the immediate vicinity of those church-yards that are still daily employed as places of interment.

In those enclosures, it is familiarly known that the soil is in a very loose, porous condition ; that the bodies interred in it are deposited but a few feet beneath the surface, and consequently, that the air extricated from their decomposition is readily mixed with the external atmosphere. If, therefore, such decomposition of animal matter beneath the surface, could give origin to fevers, I call upon the advocates of this absurd doctrine to assign the reason, not only for the exemption from malignant fevers, but the health enjoyed in the vicinity of those enclosures, and indeed by those who are immediately concerned in the interment of the dead.

But I proceed a step further, and deny that the effluvia arising from the decomposition of animal or vegetable matter, is essential to the production of yellow fever. That such vitiated atmosphere lends wings to the emanations proceeding from the diseased body, is a truth established by every visitation of yellow fever ; but that it is essential to the first production of the disease, is unequivocally denied ; and in this all concur who have been practically conversant with this subject : even some of those who deny the contagious character of yellow fever, and trace it to domestic sources, are free to admit, that this disease arises from the influence of solar heat upon the con-

stitution, but totally unconnected with the external circumstances to which the indigenous remittent and typhus fevers are to be ascribed.

A late writer from the Havana,* one too who believes in the domestic origin of this disease, remarks, "Even at sea, and within the tropics, when the heat is great, the yellow fever is occasionally seen in persons from the more northern latitudes. This too," he adds, "happens on board of vessels having nothing in but stone ballast, a cargo of salt, or a like incorrupt lading; so that no putrescent matters, in any unusual quantity, are invariably present, where the pestilential fevers we speak of may arise."

In the correctness of this observation, that the material of contagion is not constituted by putrid animal or vegetable matters, I am also confirmed, by the observations of our present Health Officer, Dr. Joseph Bayley,† who informs me, that upon several occasions he has witnessed the arrival, at the Quarantine, of vessels coming from sickly ports, and conveying disease, yet in all other respects in a perfectly clean condition; and, on the other hand, that vessels laden with some thousand hides, and many hundred bags of coffee, in the most offensive and putrid state, have frequently arrived with a healthy crew; nor did they, while at Quarantine, communicate disease to any

* A Letter on the Yellow Fever, by Daniel Osgood, M. D.—published by E. Bliss, New-York, 1820.

† Appendix C.

persons, whose duty or business made it necessary to hold communication with them, or who were occupied in the discharge of the cargo of such vessels. One instance he relates, which fell under his notice, of a vessel in so offensive a condition from the causes mentioned, as to convey the effluvia to the extent of more than half a mile, insomuch that the passengers of packet boats at the leeward, passing the Quarantine at that distance, were compelled to leave the deck, to avoid the stench with which they were assailed—still no disease was communicated to any person holding intercourse with those vessels: vessels too from South America, laden with beef in bulk, and frequently in a very offensive state, are nevertheless in the most healthy condition.

From these and similar facts, I am led to the inference, that the solar heat of the tropics long continued and acting on the northern man, is the exclusive source of yellow fever. Even in those cases where ordinary fever is created by animal or marsh effluvia, the peculiarities superinduced constituting it yellow fever, are, I believe, altogether attributable to heat acting upon a body unaccustomed to a tropical sun. A reference to the facts related by Diemberbroeck, Rondeletius, Clavigero, Herrera, Howard, Chisholm, Ferriar, and many others,* whose works are on your shelves, will satisfy every impartial inquirer after truth, that animal matter will not generate pestilen-

* See Transac. of the Lit. and Philosoph. Society of New-York, v. i.

tial fever: and that vegetable decomposition will not engender it, no man can doubt, who will peruse the pages of Dr. Stewart, in his account of the yellow fever of Grenada.

It may also be remarked, as an additional testimony to that stated by Dr. Stewart, to prove that the yellow fever does not derive its origin from decomposed vegetable matter, that whenever that disease has prevailed in the United States, it has not appeared in the country, where such vegetable matter is most abundant; but has been chiefly confined to our larger cities, and those towns situated on the seaboard. This fact, that the yellow fever has never been known out of the reach of our tide waters, (except when conveyed from infected ports,) is totally inexplicable, upon the principle that this disease is the product of vegetable putrefaction. I am fully aware that the opinion has been entertained and propagated, that this form of fever prevails in the interior of our country, and especially in the vicinity of the lakes;—but whoever will consult the statements furnished by physicians residing there, particularly those of Drs. Brown, Frisbree, and Needham,* will find ample refutation of that opinion.

Some time since, in a conversation held with the late Andrew Ellicott, Esq., in presence of one of my

* American Medical and Philosophical Register—Barton's Medical and Philosophical Journal.

fellow professors,* relative to the notice taken of the fevers of the western country, as published in his journal, and triumphantly quoted by every advocate of the domestic origin of yellow fever, that intelligent and worthy gentleman frankly declared, that he considered them as nothing more than the ordinary bilious fevers, the usual produce of marsh-effluvia in every part of our country, and that they wanted the more violent symptoms associated with the yellow fever of our cities. But there are numerous facts, of a similar nature with those already referred to, which equally show the absurdity of resorting to vegetable or animal putrefaction, as the source of the malignant fever with which the United States have recently been visited.

When we advert to the condition of the city of New-York, anterior to the American revolution, and before any system of police regulations was adopted—when the south-eastern side of the city was the deposit of every species of filth, and thence emphatically denominated *Rotten Row*, we cannot withhold our surprise at the salubrity of the city at that period, and which is universally attested to by our oldest inhabitants. But when we look at the offensive state of the town during the revolutionary war, when crowded with British troops; when we recollect the immense collec-

* Appendix D.

tion of foul materials of every sort in the cellars of the numerous buildings destroyed by the great fire of 1776, during the whole of which period this city enjoyed a total exemption from the pestilential fever, we must be convinced of the very short-sighted and erroneous views of those who look no further for the origin of this evil. In like manner, the offensive state of our slips, our wharves, and our market-places, prior to the recent police regulations that have been introduced; the putrefactive processes which are at this time unavoidably attendant upon our tanneries, morocco, starch, and glue manufactories, slaughter-houses, tallow-chandleries, sugar-houses; the filthy and neglected condition of our streets, the deposits of filth of every description in various parts of our city and suburbs, furnish incontestible evidence that these are innocent, when considered as the primary causes of the mortal epidemics which have desolated our cities.

With these facts before them, can the physicians of the United States persist in the absurd belief many of them have expressed, that the pestilential fever that has appeared in our seaports, is the product of decomposed animal and vegetable matter?

The influence of an impure state of the atmosphere, resulting from these various causes, as a secondary agent in multiplying and diffusing the poison of such fever when introduced; and that this disease de-

rives its contagious character from this condition of the air, have, I trust, upon another occasion, been fully illustrated.*

From the view which has been taken of this subject, and the propagation of febrile contagion through the medium of impure air, we are led to some remarks upon the measures that are called for, in addition to the present statutes and regulations in force, to secure our city from the future spread and extension of fever, should it again be introduced.

Among the most efficient means of arresting the progress of contagious fevers, which these truths have led to, is, first, the establishment of separate apartments of houses exclusively dedicated to the reception of persons labouring under fever of a malignant or contagious character: these houses are denominated fever wards, fever hospitals, and more lately by Dr. Ferriar, Houses of Recovery.

To the celebrated Dr. Haygarth, formerly of Chester, now of Bath, the world is indebted for the first suggestion and establishment of an Institution of this nature. It had been long since observed by Dr. Lind, of Haslar Hospital, that the distance to which the contagion of fever was communicated, was very limited; in other words, that the emanations

* Observations on the Laws of Contagion;—Transactions of the Literary and Philosophical Society of New-York, vol. i. 1815.

from the diseased body, labouring under typhus fever, were incapable of infecting those in health at a greater distance than a few feet, and that in a pure atmosphere, or in a well ventilated room, the effluvia were so much diluted and weakened as to be no longer capable of communicating the disease.

These observations were afterwards tested and confirmed by the experience of Dr. Haygarth, who distinctly ascertained, that, by separating those persons labouring under contagious fever from others in the same Hospital, or by appropriating particular wards to this disease, the contagion might be prevented from spreading in those crowded receptacles of the sick ; and secondly, that, by having such wards, or separate institutions, for the reception of cases of fever, constantly open for the admission of patients, especially in crowded towns or in epidemic seasons, whole families might be at once preserved from the contagion, and that in this manner the progress of typhus fever be at least arrested, if not exterminated. Upon this principle, Dr. Haygarth was led to the establishment of fever wards, at Chester.

I soon discovered, he remarks, when speaking of the contagion of putrid fevers, “ that their infectious atmosphere was limited to much narrower extent than even the small pox. So manifestly I observed this to be the case, that in a clean and well aired room of a moderate size, the contagious poison is so much diluted with fresh air, that it very rarely pro-

duces the distemper, even in nurses, exposed to all the putrid miasms of the breath, perspiration, fœces, &c. ; whereas in the close, dirty, and small rooms of the poor, the whole family generally catch the fever. Hence," he adds, " we may conclude, that, in a well aired and clean apartment, the air is seldom so fully impregnated with the poison as to acquire an infectious quality."

Dr. Haygarth's views on this subject were first communicated in a paper read before the Royal Society in 1777* ; but they were not carried into operation until the year 1783, when the first fever wards were established at Chester, under the direction of that benevolent and learned physician.

The good effects of that institution soon became apparent, and indeed exceeded the most sanguine expectations ; for they not only arrested the progress of contagion, and diminished the number of the sick, but they were signally useful by lessening the mortality of those diseases that were received within their walls.

The benefits derived from the fever wards of Chester, soon led to the subsequent establishment of similar institutions in Liverpool, Manchester, London, Leeds, Newcastle, Dublin, Cork, Waterford, and indeed, I may add, in most of the principal cities and populous towns of Great Britain.

* See Philosophical Transactions, vol. 68.

The advantages derived from such establishments are at this day too well known and too apparent to require illustration. In Europe they have received the unanimous approbation of all who have made them the subject of attention. As they have not yet, however, been introduced into this country, except as temporary accommodations for the sick, during the prevalence of fever in the cities of New-York and Philadelphia, and as a permanent provision appears to be called for to meet the exigencies arising from the annual prevalence of bilious and typhus fevers among the poor, I must beg your attention, while, in a few words, I notice the more prominent advantages that society will receive from the erection of such institutions in the neighbourhood of our most populous cities.

Whenever fever of a contagious character, whether it be in the form of a typhus fever, dysentery, or any other type of malignant fever, likely to spread through a crowded population, agreeably to the laws of contagion already referred to, by the removal of the individual first affected from the confined and filthy dwelling in which he may be lodged, to a clean and well ventilated apartment, his prospect of recovery is greatly increased by the change of atmosphere alone, independently of the comforts of good nursing, and the benefits of the best medical aid with which such institutions are provided.

It is, in confirmation of this truth, to be observed, that the far greater number of the sick, ill of bilious

and of typhus fever, who in the past season were removed to the Hospital at Bellevue, and to the New-York Hospital, recovered by the change of situation, while those who refused the benefits of such removal, and thought proper to remain in the noisome and crowded apartments in which they sickened, generally perished.

To the family in which the sick reside, and indeed to the neighbourhood, such removal is also a great additional security for the exemption from disease, inasmuch as they escape the emanations from the diseased body, and which in such atmosphere readily multiply and assimilate to the poison introduced, the filthy and fermentable air surrounding the sick. I need not add, that in proportion to the multiplication of the poison is the danger to those who remain immersed in such tainted atmosphere. In Europe it is calculated that for every person thus removed, the infection of twenty others is prevented. The facts in illustration of this truth are so numerous in the pages of Haygarth, Clark, Ferriar, and others, that they cannot fail to carry conviction to every unprejudiced mind, not only of the safety, but of the advantages derived from the measures now recommended.

The propagation of the poison of yellow fever in such foul condition of atmosphere, was especially exemplified in this city, in 1791, 1795, 1798, 1805, 1819, and indeed, I may add, in every visitation of the yel-

low fever, the disease has ever been co-extensive with the foul atmosphere in which it has been introduced ; while other parts of the city, equally if not more foul, have been proverbially healthy ; in other words, they wanted the spark to kindle the flame.

Under the conviction of the benefits to be derived from a permanent establishment to receive the sick poor, and to separate them from the well, and thereby to arrest the progress of infection, I early in the past season called the attention of the Board of Health to this subject, and recommended, upon the first appearance of typhus fever in our city, the instantaneous removal of the sick, either to Bellevue, or some other suitable place to be provided ; but such removal, owing to the want of accommodation, to the extent desired, proved impracticable. I then earnestly urged upon the Board the necessity of some permanent provision being made on that subject, commensurate with the increasing population of this city.

A committee was accordingly appointed to make the necessary inquiries, relative to the expediency of such an establishment, and to ascertain the site most proper for such an institution. A spot of ground, connected with the public property at Bellevue, was found to possess every advantage that can be derived as it regards air, water, and other means of accommodation. By several members of that committee such an institution was deemed of great utility, and they concurred in the opinion that the plan proposed

ought to be carried into effect without delay ; while by other members it was considered to involve an expense altogether inexpedient during the present depression of the times. But when the Board of Health and the Common Council shall be convinced that the sufferings of the poor will be alleviated, and many valuable lives preserved to their families and to the community ; that by arresting the progress of contagion, the inhabitants will be secured from the further diffusion of an infectious disease, they cannot but unite in their approbation of such an establishment. When it is also taken into consideration that an abundant quarry of excellent building stone, the property of the Corporation, is on the premises ; that mechanics of every description that can be required are to be found in the Penitentiary, perfectly competent, under the direction of a skilful architect, to erect the plain unadorned structure that is contemplated, and thus make some return to the state for their maintenance ; and consequently that the chief expense to be incurred will be for lime and timber ; I cannot but indulge the belief that the Corporation will take the necessary measures to carry the plan proposed into operation, in time to meet the exigencies of the ensuing year.

Another important measure, calculated to prevent the generation of contagious diseases among the poor, and of arresting their progress, is attention to the situation and construction of their houses, so as to se-

cure the benefit of sufficient space and air, embracing the means of enforcing the practice of cleanliness, and of limiting the number of their inhabitants, and, when necessary, the power of removing the sick. These preventive measures cannot be carried into effect, without overcoming considerable obstacles, without interfering with the privileges of the citizen, the disposition of private property, and with domestic economy. Considerable expense must also be unavoidably incurred. These radical means for preventing the generation and diffusion of contagion, cannot be completely attained without the aid of the State Legislature. Much, however, may be accomplished under the existing laws, by our magistrates, and those public bodies to whom are delegated the trust of superintending the health, the comfort, and the morals of the community. But where these powers prove insufficient, the Legislature doubtless will assist in the completion of a plan so manifestly directed for the benefit and safety of the community. For what can so strongly demand the attention of the Legislature as the health and strength of the great mass of the people, and the security of all ; objects to be attained by measures which are alike conducive to private virtue and happiness, to public order and economy, to national wealth and power*.

* See Letter for bettering the condition of the poor. Also Stanger on Contagious Fever in the Metropolis. See also Murray on the Fever Institution of London.

Secondly. Among the means to be employed for the purpose of preserving the purity of our atmosphere, is the introduction of Common Sewers, communicating with the adjacent waters on both sides of the city.

There is, perhaps, no town so well situated, having a descent on one side to the Hudson, and on the other to the East river, to secure the advantage of such outlets, as that of New-York. With these again, lateral branches might be established, that would most effectually convey from our soil every species of filth, that otherwise must be deposited within the city, not only to the great annoyance of its inhabitants, but which cannot fail to become actually injurious to the health of the community. Indeed, I do not hesitate to express the opinion, that if the city were supplied with more numerous common sewers, and, in addition to the ordinary materials conveyed by them, the privies could be constantly evacuated through those channels into the adjacent waters, or by the introduction of water closets, and the removal of the night soil, upon a plan recently suggested, and submitted to our Corporation, by a gentleman* of acknowledged abilities and mechanical skill, both the water and the air of the town would be rendered more pure, and the general salubrity of the city greatly promoted.

* John Stevens, Esq., of Hoboken, New-Jersey.

At present, it is calculated that nearly one-twelfth part of the surface of the city is occupied by privies ; and, consequently, the soil, consisting of a very porous sand, a constant percolation from those deposits of filth into the wells of the city, must be the result.— This accounts for the impurity of the water drunk by the inhabitants of New-York, and the effects it produces upon strangers, before they become habituated to its use.

“ It is so true,” says Mr. Volney, who passed some time in New-York, “ that the water drunk in the lower parts of the city, receives filtrations from the cemeteries and privies, that in Front-street I found the water in my decanters become ropy, if kept three days, in the month of May, and at length acquire a cadaverous stench.”*

This evil, of which the citizens of New-York are all sensible, may be effectually guarded against by the establishment of well constructed sewers, similar to those of the great cities of Europe, and those recently introduced into the city of Philadelphia ; and, until these outlets are provided, we must be content to drink water loaded with impurities, and to breathe an offensive and an unwholesome atmosphere.

Thirdly. Connected with this subject, it may be observed, that the practice of interring the dead in the Cemeteries of the city, calls for some additional police regulations.

† See his *View of the Climate and Soil of the United States*, p. 323.

I do not consider it indispensably necessary, either for the comfort or the health of the inhabitants, that this custom should be altogether prohibited ; but I would recommend, that interments should be exclusively confined to *public* and *private* vaults, and that no grave should be permitted under any circumstances : for such is the loose texture of the soil in grave yards, where this mode of burial is practised, that as soon as the decomposition of the body has begun, the gases which are extricated will find egress, and mix with the atmosphere, rendering it more or less offensive and impure, and consequently a medium of spreading contagious diseases that may be introduced within the sphere to which such impure air may extend. Another measure, calculated to counteract offensiveness in vaults, and to absorb and decompose the impurities that they may contain, will be, to cover the floors with a stratum of lime, several inches in depth, and to cover the walls with the same material.

By these precautions, the practice of interring the dead in cities may be, to a certain extent,* safely continued, at the same time that it allows those feelings of our nature to be gratified, that incline us to mingle our ashes in the same tomb with those to whom, when living, we are allied. Enclosing such cemeteries by trees which vegetate early, and continue their foliage late in the autumn, will also greatly contribute to pre-

* Appendix E.

serve the purity of the air, and afford to such enclosures all the advantages to be derived from public squares. Here, too, it may be remarked, that the practice of planting trees throughout the city, especially on the sidewalks of our widest streets, should be recommended, if not made the subject of an ordinance by our Corporation; for certainly there is no measure so directly conducive to the general purity of the atmosphere, at the same time that it furnishes a defence from the rays of the sun, as the foliage of our largest trees, particularly the plane-tree—the horse-chesnut—the elm—the lime, or linden—the black walnut, and the catalpa, which, while they promote the health of the inhabitants, constitute no inconsiderable addition to the beauty of the city.

Fourthly. A great and permanent improvement of the city of New-York, and one that cannot fail essentially to contribute to the health of its inhabitants, by removing a constantly increasing source of evil, is, to place the Wharves, Docks, and Slips, in such state as to remain free from the nuisances that at present infest them. This, in my opinion, is only to be effected by substituting stone for wood in the construction of our wharves. A permanent face of stone, carefully laid and cemented, should be given to our city, extending from the Battery along both the East and North Rivers; and the piers or bridges projecting from the wharves, for the accommodation of shipping, and every other description of vessels.

should be so constructed, as not to intercept the free passage of the current.

The materials for the construction of such wharves, exist in great abundance in the vicinity of the city, are very accessible, and, taking into account their durability, compared with the perishable nature of wood, are relatively cheaper, and on all accounts to be preferred. The cities of Rochfort, Rochelle, Rotterdam, Bordeaux, Bilboa, Cadiz, and indeed most of the old seaports of Europe, as well as some begun in our own country, are in this manner surrounded by a wall of stone, which essentially guards them against those deposits of filth and vermin that necessarily accumulate in the cavities and constantly increasing crevices of docks constructed of wood.

If such line of stonework should be carefully constructed, and rendered impervious to water, there is reason to believe that great additional value would be given to all the adjacent property ; for, by rendering the cellars dry, they can be appropriated with great safety to any of the purposes for which they are designed. These advantages, it is believed, with a small addition to the present rates of wharfage, would also nearly reimburse the proprietors the expense of this permanent improvement of our city. Is it not, therefore, adviseable, that when any new docks or wharves are to be constructed, or the old and decayed ones to be renewed, that an ordinance be passed by our Common Council, compelling the proprietors

to construct or rebuild such wharves of stone. I am aware this will prove a difficult, and at first, an expensive undertaking ; but, like another important public measure to be recommended, the longer it is delayed, the greater will be the obstacles to its accomplishment.

Fifthly. The streets of our city that are narrow, especially those connected with our markets, and other places of public business and resort, as far as opportunities may offer, should be widened, and as few lanes or alleys as possible should be permitted within the limits of the city. But upon this subject, the members of our Common Council appear to be apprised of the close connexion which exists between the construction of the city and the health of its inhabitants. During the existence of the plague in London and Marseilles, it was observed that its prevalence was chiefly confined to those parts of the town most crowded with inhabitants, where the streets were narrow, and consequently the air most impure ;—but in the more elevated parts of those cities, where the inhabitants enjoyed a pure air and spacious apartments, the disease made no progress, insomuch that Lord Clarendon, upon his return to town, finding that his friends in the higher walks of life, had escaped its fury, gave the disease the appropriate denomination of the *poor's plague* ;—and, it may be added, that much of the virulence of the disorder, as well as its great spread and mortality, were ascribed

to the narrow and filthy streets in which it was introduced. I feel compelled to remark, that hitherto the condition of our streets, as it regards the means of cleanliness, has not received that attention from our magistrates which the subject demands, either as it regards the character and reputation of the city, or the health of its inhabitants. I am apprised that various measures have been resorted to, without success, to accomplish this object. A little attention to this subject, on the part of our police, and an inquiry as to the means employed in different parts of the world, could not fail to suggest such a system as would lead to all the results that can be desired—while at the same time it will add an essential improvement to the appearance and the character, as well as the health, of our city—give additional value to property, and thereby add to those inducements which the local situation and commercial advantages of this metropolis already present ; and, it is not to be doubted, that the small additional tax which these improvements may call for, will be cheerfully paid in return for the enjoyments and benefits that they secure to our citizens.

Lastly. Connected with the means of improving the health of the city, and one which I feel it my duty to urge upon the attention of the Board of Health, and the members of the Common Council, is that of obtaining a more abundant source of Pure and Wholesome Water, than that with which this city is at present supplied.

Whether we view this subject as connected with health, as subservient to the purposes of domestic comfort, for the extinction of fires, the supply of public baths, and cleansing our streets, it is of the greatest importance, and calls for the immediate notice both of our town council and the Legislature of the State.

Two questions immediately arise upon this subject.

1. What are the sources whence such supply may be obtained? And,
2. What is the expense, and whence are to be derived the means, of accomplishing this important object?

In reply to these inquiries, I remark, first, that from the surveys which have been already made (under the direction of that eminent engineer, Mr. Weston) of Saw-Mill River at Phillipsburgh, and of Rye Pond in Westchester County, the source of the Bronx, there can be little doubt that either, but particularly the first, will afford, at all seasons of the year, a copious and unceasing supply of water, ascertained to possess all the properties of pure and wholesome water.

The expense attendant upon this subject, will be,

1. To purchase the privilege from the Manhattan Company, to whom it has been delegated by legislative provision.
2. The purchase of the right to either the Saw-Mill River, Rye Pond, or both, should experience render it necessary. And,

3. The actual expense of conveying and introducing the water.

As it regards the first, it may be presumed that the Manhattan Company will be readily disposed, for such important public purposes, to relinquish, for a reasonable equivalent, what at present is to them a troublesome and unproductive privilege.

2d. The use of the waters of the Saw-Mill River and Rye Pond, must be obtained by legislative authority, unless, as I believe, the Manhattan Company already possesses, upon paying any damages that may be awarded, the right of commanding any water resources, however remote from this city. The compensation can only be ascertained by estimation, until adequate authority may compel an assessment of damage.

3d. The expense of introduction, as far as relates to conduit and lateral pipes within the city, can be pretty accurately computed. But the expense of conducting the water to the main reservoir, must entirely depend upon the hydraulic principles that may be judged most proper to be adopted.

But let the expense amount to what it may, the resources to pay the interest, and ultimately to sink the capital, are abundant, and growing with the increase of our population.

All families, in case the measure should be prosecuted by the Corporation, should be compelled to supply themselves with water from the public works.

Ten thousand families, averaging five dollars per annum, would give 50,000 dollars, which, at five per cent. will pay the interest of a million, a sum in all probability more than adequate to a large portion of the expense, and which resources must increase in proportion to our increasing numbers.

No period, I remark, can be more favourable to a serious consideration of this important subject, than the present.—It is the duty of a wise municipality to prevent pauperism :—one of the most effectual means of accomplishing this object, is to find employment ; it is better even to pay liberal wages, than to maintain the poor by charity.—An alms-house is the last resort of those who have lost every sense of pride and independence, which ought always to be cherished. By affording labour, the means of honourable support are also afforded ; and, at a time when commerce is suspended, and the produce of husbandry finds no market, there must be a redundancy of population unemployed, who, if not maintained by public support, will fly to plunder for their subsistence. The alms-house is already full to overflowing, and our penitentiaries and state prisons have not the capacity to contain the numerous culprits condemned to their walls, and some of whom, no doubt, have committed the crimes for which they are condemned, for the very purpose of finding a home, however miserable, where to lay their heads. Employment alone can change this state of things, and ought to be provided.

A fit occasion now presents itself in the accomplishment of the great object that has been proposed. The details of labour incident to a great public work, such as that now contemplated, will employ many hands, diminish mendicity, and prevent crimes, and the numerous evils arising from poverty and idleness. A debt need not be feared, which carries with its effects the means of its redemption. Even should a direct tax be eventually necessary to extinguish the loan that may be made, it is assuredly better to pay such tax for labour, than as at present to bestow it in alms. There will, however, be no necessity for such tax. The loan will stand insulated from every other, be specific, and have distinct resources for the payment of interest and diminution of the principal. Posterity will have no right to complain, for they will be in the daily enjoyment of its benefits. Every additional house that is built, every new factory, hotel, bath, or other public building that requires an abundant supply of water, will afford a constant and augmenting fund to be set apart for the extinction of the whole debt that may be created. There is nothing hypothetical in these views. The experience acquired in the construction of the Grand Canal proves that the estimate of labour may be brought within the nicest calculation of expenditure; and facilities unthought of, will probably arise in the prosecution of the work, that may abridge the process and diminish the cost.

When the State is so meritoriously engaged in forming canals, extending to a distance of nearly four hundred miles, and those too necessarily passing over great inequalities of soil and elevation, and requiring numerous and expensive locks, surely no hesitation ought to exist as to the practicability of a canal less than twenty miles in extent, unembarrassed by the difficulties just mentioned, and which will be the means of supplying New-York with an inexhaustible source of water, and well calculated for all the purposes of life.

I am aware that some of the subjects of the remarks that have been offered, have already received the notice of the Corporation, although no measures have been adopted to carry them into effect : yet I deem it a duty to revive the attention to subjects of such magnitude and interest, as connected with the health of this rapidly increasing Metropolis.

APPENDIX.



(A.)

DR. BECK'S *Communications concerning the Yellow Fever at
Middletown, (Con.)*

NEW-YORK, July 8, 1820.

SIR—I have just returned from Middletown, from the mission with which I had been honoured by the Board of Health, and am enabled to inform you that at present no case of malignant fever exists in that city. Thirteen cases of that fever have been reported to the Board of Health, as having occurred in the city and township of Middletown, since the 3d of June last. Of these, nine were in the city, and the remainder in a place called the Upper Houses, about four and a half miles north of it. The two last persons sick with the disease were taken on the 26th of June, and died in five days after. Since that period no new case has occurred. On the 5th July, two persons were reported as sick with fever, but the physicians in attendance united in opinion that it was not of the malignant type, and that the cases were different from those which had been previously reported. It may be proper to add, that they were reported only in compliance with an order from the Board of Health, that all cases of fever should be made

known to them. With these solitary exceptions, no instance of an acute or febrile disease of any kind was known to exist in that city. More decisive evidence could not be required of the general health of a place containing at least three thousand inhabitants.

Judging from present appearances, there is every reason to hope that the progress of disease in that city is arrested. From the precautionary measures adopted by the Board of Health, (a copy of which accompanies this,) it is improbable that any new source of infection will be permitted to approach the city; and certainly there is nothing either in or about the city to create the least suspicion that a malignant fever can be generated there, whether it be sought for in *new made ground*, or in *animal or vegetable filth*.

It is well known, that Middletown has long been celebrated for the general health of its inhabitants; and this character is certainly not undeserved, if a happy combination of local advantages can exercise any influence in protecting the constitution from the aggressions of disease.

His honour the Mayor informed me, that it is his intention to communicate frankly and promptly to the New-York Board of Health, every case of malignant disease that shall be made known to him.

I cannot conclude this note without stating that I have received from the mayor and physicians of Middletown every possible facility to aid me in accomplishing the object of my mission.

I shall hereafter report to the Board, somewhat in detail, the facts which I have collected concerning the origin and extension of the disease.

I have the honour to be, your most obedient and humble servant,

JOHN B. BECK.

The Hon. P. A. JAY,
Pres't. Board of Health.

A Report to the New-York Board of Health, concerning the nature and origin of the Malignant Fever in Middletown, Connecticut. Presented on the 17th of July, 1820.

IN compliance with the instructions received from the New-York Board of Health, to proceed to Middletown, Connecticut, for the purpose of inquiring into the nature and origin of the fever which had been reported to prevail in that city, I left New-York by the first conveyance after my appointment, and reached Middletown on the 5th of July. As soon as possible after my arrival, I presented to his honour the Mayor, a letter addressed to him by Mr. Jay, the President of the New-York Board, and which informed him of the object of my visit to Middletown. He had no sooner read the letter, than he communicated to me, in the most unreserved and candid manner, every fact in his possession which could tend to aid me in accomplishing the designs of my mission, adding at the same time, that neither himself nor the Board of Health of Middletown, wished to conceal any thing that might inform the public of the actual state of the health of the city. In addition to this, I held interviews with all the physicians of the city, who had attended upon the different cases of fever. From these sources I obtained most of the facts embraced in the subsequent report.

In my former communication to the Board, I stated that 13 cases of malignant fever had been reported to the Board of Health of Middletown, since the 3d of June last, nine of which were in the city, and four at a place called the Upper Houses, about $4\frac{1}{2}$ miles north of it. Of the whole number, 7 proved fatal.

On inquiring of the physicians concerning the character of the fever, Drs. Miner and Tully stated that it was entirely different from the ordinary cases of fever occurring in that city, and that it was precisely similar to what they had been in the habit of seeing occasionally on board of

vessels arriving from the West Indies, and our southern ports. Dr. Gilbert, who has resided in the West Indies, unhesitatingly pronounced the case of Mrs. Cotton, whom he attended, to be the malignant fever of the tropics.

On inquiring into the particular symptoms, Dr. Tully, who had been the physician to all the cases except five, and had also seen three of these previous to death, mentioned the following as the most prominent, and as characteristic, in a greater or less degree, of all the cases :—The patients were seized suddenly with chills, violent in degree, but short in duration ; pains in the back of the head and neck, extending down the spine to the small of the back and legs ; the countenance presented an appearance of great anxiety and dejection—in most of the patients the eyes, at the very onset of the attack, were of a dull, muddy, reddish colour, and towards the close they became yellow ; the region of the stomach was uniformly the seat of peculiar distress ; in some instances, the patients complained of a burning sensation in it ; at others, of a heavy load oppressing them, and at others again, of a sense of vacuity, producing great uneasiness. This state of the stomach, Dr. Tully informed me, he had never seen in any case of typhus fever, which is the ordinary fever in that vicinity. In addition to this, the stomach was uniformly irritable, showing itself in frequent vomiting and retching, especially on taking any liquids. In several of the cases a dark coloured matter was thrown up. The skin was slightly moist, and in none of the patients hotter than natural. On applying the hand to the surface, a slight stinging heat was first felt, but afterwards it was found to be cooler than the temperature of the hand. In several of the cases the skin had the yellow tinge, and in one it was of a dark mahogany colour. The tongue varied in its appearance ; in some it was natural and moist, in others covered with slight greyish slime ; in others again, a brown crust appeared upon it towards the close of the disease.

In all the cases which Dr. Tully saw, the tongue was very red at the close of the disease. The thirst at the commencement was very great, but this continued no longer than about 24 hours, after which they were indifferent about taking liquids. The pulse in the majority of instances beat from 80 to 90 in a minute—in a few it was as slow as 50, and in every case entirely destitute of hardness and strength. The bowels in the early stages were generally very torbid, occasionally lax. In some cases coma and delirium were present—in others the integrity of the mental faculties was preserved to the last.—A tremor, unattended with coldness, was a prominent symptom. After the first 12, 24, or 36 hours, an evident remission of all the symptoms took place, so much so, that many of the patients said they were perfectly well: after this, great prostration of the sanguiferous system, together with an aggravation of all the symptoms, ensued. Muscular strength continued to the last, especially in some of the worst cases. In many cases bloody discharges occurred from the nose and the mouth; and speedily after death, putrefaction commenced, and bloody sanies issued from different parts of the body.

Such are substantially the prominent symptoms as detailed to me by Dr. Tully, and the observations of this very intelligent physician were in every respect confirmed by Dr. Miner, who visited the cases in consultation with him. As there could be no doubt concerning the nature of the disease, I proceeded next to inquire into its probable origin, and subsequent extension; and on this point I have been industrious to collect all the facts, that may shed any light upon a subject of such deep interest to the community at large. And such as I found them supported by the best testimony I could obtain, I shall frankly communicate.

1. As early as the 3d of June last, a seamen, by the name of Orrin Fargo, was brought into Middletown sick with ma-

lignant fever, from on board the sloop *Antelope*, of Killingworth, a coaster between New-York and Connecticut.— Dr. Tully attended him, and was informed that this was the seventh day since he was first taken sick. He died with black vomit on the 7th of June. From a statement of the captain of the *Antelope*, made to Dr. Tully and myself, it appears that Fargo had arrived at New-York from Savannah, in the schooner *Milo*, on the 25th of May. On the Saturday following, he had overworked himself on board the schooner, and in the evening was taken sick. He then took passage on board the *Antelope*, for Middletown, where he belonged.

2. About three days before Fargo died, Daniel H. Vail, captain of the sloop *Antelope*, in which Fargo was passenger, was taken sick with fever of the same character. The symptoms in this case were milder than in the former, and the patient recovered; but both Drs. Miner and Tully considered them so decided, that if even the case had occurred singly and without any other succeeding it, they should have called it a case of the same fever which appears on board of vessels from the south. Capt. Vail told me that his sloop lay in Burling-slip for two weeks previously to his leaving New-York.

It will be observed that both these cases occurred anterior to the arrival of the brig *Sea Island*.

3. On the 16th day of June, Wm. Harrington, tide-waiter, was brought into Middletown, from on board the brig *Sea Island*, with malignant fever; on the following day he died, that being the 5th day after he was taken down— Dr. Tully saw him for the first time on the 4th day of the disease, and he had then the dark yellow hue of the skin; his eyes were yellow, and he vomited continually.

As the circumstances connected with the vessel, on board of which Harrington was taken sick, must be deemed of much consequence in tracing the origin of this and the subsequent cases that occurred, I shall now relate all the material facts concerning her, which I obtained from a careful

examination of Mr. Williams, the mate of the vessel. The brig Sea Island left Saybrook about the 1st of December, 1819, and sailed for St. Bartholomews; from thence she returned to Wilmington, N. C. where she took in a miscellaneous cargo of lumber, corn, flour, &c. and then returned to the West-Indies, to St. Jago de Cuba. While there, two of her men died of yellow fever, and on the homeward voyage, a third fell a victim to the same disease. Nearly all the hands were also indisposed during the passage. On inquiring what was done with the clothes, &c. of those who died, he stated, that all the clothes which had been worn by the men during the sickness, together with their bedding, were immediately thrown into the sea. Some of the clothes of the 2d who died, but which he had not worn, were immediately washed very thoroughly, and then put up in a chest.

In the beginning of June the brig arrived at Saybrook, at the mouth of the Connecticut river. Here Harrington, the tide-waiter, went aboard of her, and on Saturday she came up to Middletown and anchored in the middle of the river, opposite the city. On Monday she unloaded and sent ashore part of her cargo, which consisted chiefly of sugar and molasses. At noon she weighed anchor and proceeded up the river.—The next morning Harrington was taken sick and remained on board until the day previous to his death. On the night before he was taken sick he indulged in drinking and smoking to excess.

While the vessel lay opposite the city, I have it in evidence that there was an unrestrained intercourse between her and the shore. Several persons went on board of her, none of whom have been taken sick, except the son of Harrington. On Sunday all the sailors came ashore, and remained for half the day. It does not appear that any of them went to Mrs. Childs' or Mrs. Cotton's, although they landed at no great distance from the place where these women lived, nor could I learn that any clothes were sent ashore to be washed. While the vessel lay off the town

two of her hands were discharged—a black man, who went immediately into the country, and a lad who took his clothes and bedding with him and went to his mother's, who lived under the same roof with Mrs. Bayley, who was afterwards taken sick.

4. Daniel Harrington went on board the brig while she lay opposite the town, and remained there during the whole of Sunday and subsequent night. On Monday morning he left the brig, and was taken sick the next day with malignant fever. This patient recovered.

It may be proper to state that Wm. Harrington's house, in which both he and his son were sick, is situated in a distant part of the town from that opposite to which the brig lay. None of the attendants were taken sick.

5. The next case that occurred was that of Samuel Knight, a seaman, who had just returned from sea. He was taken on the 15th of June, and had previously been aboard the Sea Island, though he did not remain there more than 5 minutes. He recovered.

6. Lucy Bailey was taken on the 16th inst. She lived in a house near the river in Union-street, at some distance from Mrs. Childs' or Cotton's. It will be recollected that in the same house lived the mother of the lad who had been discharged from the brig. His clothes were washed here, and his bedding put into the barn. Mrs. Bailey, however, told Dr. Tully she had had nothing to do with the clothes. She recovered.

The next four cases were those at the Upper Houses. The occurrence of these cases at this place is so very singular, that it will be necessary to speak particularly of their locality, and of the circumstances attending them. They all took place in a cotton factory about four and a half miles from the centre of the city, situated in a pleasant valley, and without any houses in the immediate neighbourhood. The distance between this and the river is perhaps about half a mile. Dr. Tully accompanied me to this place, and on visiting the factory we found nothing that was

in the least offensive. From its situation, too, one would suppose that it must enjoy a constant and free circulation of air. It may be deemed by some of consequence to state, that the factory had been closed for some time, and that they commenced working in it only a short time before. There were at that time 7 girls and 3 men employed in it. Such were the circumstances at the factory when John Wild, one of the men, was taken sick. This was the 7th case.

7. John Wild, taken sick on the 19th June, and died on the 25th. He had redness and wildness of the eye—yellow skin—vomited a dark matter, and on the last day brought up some blood. On inquiring of the superintendent of the factory where Wild had been previously to his attack, we found, that two days before, he had been on board of a vessel from the West Indies, called the brig *Defiance*, of Middletown, and then lying alongside a wharf about two miles below the factory. This brig had arrived here the 15th of June, and sailed again on the 19th. While in the West Indies, one of her men was sick with yellow fever. She went up the Oronoko, and brought home a cargo of hides, tallow, molasses, &c. The vessel is said to have been clean—between her and the shore there was a constant intercourse—numbers of people went daily aboard of her. I cannot learn that Wild was aboard of the brig *Sea-Island*, though at the time he was taken sick she lay opposite the factory, but on the other side of the river, where she had grounded. It was while she lay here that Harrington was taken from her and carried down to Middletown.

8. Abigail Treat, a girl employed at the factory, taken sick on 21st June, two days after Wild was attacked, and with the same symptoms—red eyes—great distress about the præcordia, together with irritability of the stomach; brought up the same kind of matter. She had been at the factory for one month. She recovered; the fever coming to a crisis on the seventh day.

9. Rhoda Clark, another of the girls working at the factory, where she had been only three days, was taken sick on the 23d June. She was immediately removed to her father's, about a mile and a half south of Middletown, where Dr. Tully attended her. She had the red and muddy eye—great præcordial distress—coma and decided black vomit. She died on the 27th.

10. Catharine Hubbard, another girl at the factory, where she had been one week, was taken sick at the same time with Rhoda Clark. Symptoms very similar to those of Abigail Treat. She recovered.

It does not appear that any of the three girls who were sick at the factory had been on board of any vessel. On the Sunday previous, some of them had been down to Middletown, but at this time the Sea-Island lay four and a half miles above that place.

During Wild's sickness, the superintendent informed us, that the girls occasionally went in to see him, and that they slept in an adjoining room, with only a wooden partition between them. Only one circumstance more concerning the factory is worth noticing, and this is, that a state of invariable general health has always prevailed about that place.

The three remaining cases occurred in the city of Middletown.

11. Mrs. Childs was taken sick the 22d of June, and died on the 29th. Concerning the nature of this woman's disease, it may be proper to state, that there was a difference of opinion between some of the physicians. Dr. Tracy, the attending physician, supposed that she had had epilepsy and jaundice, while Dr. Tully, who saw her on the 28th, pronounced it a case of malignant fever. A relation of a few of the prominent symptoms, will enable the reader to form an opinion for himself on the subject:—pains in the head, back, and limbs—great præcordial distress—irritability of the stomach—cool skin—moist tongue—soft pulse—yellow skin—coma.

Mrs. Childs lived in a house in Ferry-street, about ten rods from the water's edge, and nearly opposite lay the brig Sea-Island. It does not appear that any clothes from the brig were washed by Mrs. Childs, nor does she keep a sailor's boarding-house. I shall only add, that on the same day in which she was taken sick, she had worked in her garden under a hot sun.

12. Mrs. Cotton lived in a house a few rods south of Mrs. Childs. She was taken sick on the 26th June, and died on the fifth day of the disease. Dr. Gilbert was her physician, and he called it a decided case of malignant fever. Mrs. Cotton attended upon Mrs. Childs during her sickness. Neither Mrs. Cotton nor Mrs. Childs had been aboard of any vessel.

13. Joseph Simmons, taken on the 26th June, and died in five days after. This case was represented by Dr. Tully as one of the most malignant of the whole. On inquiring into the history of this case, I found, that while the brig lay opposite the city, Simmons was at Colchester, about 20 miles distant; and that when he arrived at Middletown, the vessel had already passed up the river. He lived in Ferry-street, only three or four rods N. W. of Mrs. Childs. On the same day on which he was taken sick, he swam once or twice across the river.

Such is the detail of the circumstances connected with the several cases of fever that were reported. In looking around the city for any domestic cause which might have produced them, I found none that was adequate. Middletown is distinguished for the salubrity of its situation and the health of its inhabitants. It is built on the slope of a beautiful hill, and most of the houses are at considerable distances from each other. The freest circulation of air pervades every part of it. The town is cleanly, and even along the river and wharves, there are no accumulations of filth of any kind. The ship yard in the neighbourhood of Mrs. Childs' house (about which something has been said to induce the belief that it was very filthy) was uninclosed,

and had nothing in it but a small quantity of timber scattered over its surface. There was nothing about this place which even the most distempered imagination could convert into a source of infection. The same will apply also to a distillery of rum in the neighbourhood. Indeed, nothing seems capable of explaining the facts on this subject, but to admit that, with the exception of the first two cases, which occurred anteriorly, the existence of malignant fever in Middletown was owing to the presence of this vessel from the West Indies. Otherwise it is unaccountable why, in a place where there is a total absence of all the causes contended for by those who maintain the doctrine of domestic origin, and at a season too, which is there usually the healthiest in the whole year, so many cases of a malignant fever should occur so rapidly in succession. Besides, upon any other principle, it must seem marvellous that the march of disease should proceed with the progress of this vessel up the river. She lay opposite to Middletown, and the fever followed—she lay opposite the factory, and the fever made its appearance—she proceeded to Hartford, and there we have the official report of the physicians to the Board of Health, that at least one case of malignant fever occurred, which was referable to this vessel. It is true that all the cases cannot be distinctly traced. This, however, is immaterial. The fact, that somehow or other the disease was connected with the presence of this vessel, stares us too broadly in the face to admit of a denial, and it shows, beyond all controversy, the propriety of those Quarantine regulations, which by some are ridiculed, and by others are considered so unjust and oppressive. And this seems to me to be a fair conclusion, from the facts admitted by both the contending parties on the origin of Malignant Fever.

I have thus presented to the honourable the Board of Health whatever of well ascertained fact I obtained while at Middletown, and which I conceived to have the least bearing upon the elucidation of so important a subject,

without regard to preconceived opinions or conflicting theories.

I must again make my acknowledgments for the uniform politeness of the mayor and physicians of Middletown. To Doctors Miner and Tully I owe a large debt of gratitude, for the liberality with which they communicated to me all the facts in their possession, on the subject of my mission. Dr. Tully accompanied me to all the places which I found it necessary to visit, and the labour of a difficult and delicate undertaking was thus rendered comparatively light.

All which is respectfully submitted.

JOHN B. BECK.

B. (*See page 22.*)

PROFESSOR Arcjula, who kept a regular series of meteorological observations at Cadiz, observes, that the yellow fever did not prevail in those years when a greater degree of heat was experienced, than in the years of its prevalence. The following are his remarks, as introduced into the Reports of the Pestilential Disorder of Andalusia, by Sir James Fellowes, M. D. &c. &c.

“It appears from these general results, that the year 1800 was not the hottest of those in which meteorological observations were made; for it is evident, that in the year 1790, the thermometer rose to 90 degrees, which is 2 or 3 more than its greatest elevation in the calamitous season of 1800.

“The year 1789 was exactly equal to 1800. The year 1792 was 1 or 2 degrees less than 1800.

“The year 1791 was less than 1800 by 1.07 degrees.

“1794 varies 2.07 degrees less than 1800.

“ In 1799, a year in which the mercury in the thermometer was uniformly lower, there is a difference of 5 degrees less than in 1800.

“ And lastly, in the year 1803, the mercury rose in July 1.03 degrees more than in 1800 ; and in August, .03 more than the day in which it was highest in the year 1800 ; thus it is clear, that in 1803, the temperature was higher in Cadiz than in 1800.

“ From the whole of this abstract it appears, that if the high temperature of the year 1800 had been the cause of the epidemic, it would have produced a more powerful and injurious effect in 1790, in which year the quicksilver in the thermometer rose considerably higher. We should likewise have experienced it more in 1803, when the mercury rose still higher, and the heat was more constant.

“ The epidemic would have prevailed equally in the year 1789, in which the degree of temperature was the same as in 1800 ; and it might have been, by the same rule, repeated in 1791, 1792, and 1794, in which years the same degree of temperature was observed, with very little difference, as in 1800.

“ It is therefore an unsatisfactory conclusion to attribute the disorder which broke out in Cadiz, to the height of the temperature, when we find from these several statements, that the year 1800 was not the hottest.”

Similar facts are recorded by Dr. Lining, in his account of the yellow fever of Charleston :—

“ Within these twenty-five years, it has only been four times epidemical in this town, namely, in the autumns of the years 1732, '39, '45, and '48, though none of these years, excepting that of 1739, whose summer and autumn were remarkably rainy, were either warmer or more rainy (and some of them less so) than the summers and autumns were in several other years in which we had not one instance of any one being seized with this fever ; which is contrary to what would probably have happened, if parti-

cular constitutions of the weather were productive of it without infectious miasmata.”*

Dr. Warren also observes, relative to the malignant fever of Barbadoes, that “it does not seem to take its origin from any particular constitution of the weather, independent of infectious miasmata.”

See also *American Medical and Philosophical Register*, vol. i. p. 293, vol. ii. p. 220, vol. iv. p. 296; wherein it will be perceived, that in the years referred to, the city of New-York enjoyed an exemption from yellow fever, when the same disease was prevailing in other parts of the union, and when the range of the thermometer was much higher than in many of those very seasons in which it had formerly prevailed in this city. Experience too, as it regards the city of New-York, contradicts the fact alleged by Dr. Irvine of Charleston, that “whenever the yellow fever has appeared, that it has invariably been so in a season generally sickly, both in town and country;”—on the contrary, during many such visitations of yellow fever, New-York has been otherwise proverbially healthy; and in the present year, when our neighbours have suffered sorely from yellow fever, this city has enjoyed an exemption from the pestilence, while in other respects it has proved an unprecedented season of general sickness.

C. (*See page 27.*)

*Communication from DR. JOSEPH BAYLEY, Health Officer
for the Port of New-York.*

NEW-YORK, November 10, 1820.

DEAR SIR,—At your request, I am induced to give you a concise statement of some observations which are founded

* *Essays and Observations, Physical and Literary*, v. ii. p. 407.

on facts, as noticed by me at the Quarantine establishment of this port, relative to the influence which the apparently foul or clean condition of vessels has on the health of their crews ; which occurrences were recently mentioned to you, when we were conversing on this subject. I have known many vessels to arrive here, from ports where yellow fever prevailed, that were free from any unusually offensive smell, and their cargoes in a sound state ; also vessels in stone ballast, from ports similarly circumstanced, which were infected with the same contaminated air that existed at the place they sailed from, without its appearing to proceed from any foul materials generating it on board such vessels that could be detected by the senses. The evidence of such infection was not only manifested by the crews and passengers having died on board after leaving port (which, in many cases, would properly be ascribed to their being infected before they sailed), but even after such crews had apparently resisted the malignant influence of such infected port, they have sickened and died of yellow fever after they began to discharge the cargoes, which were in good condition. May not such occurrences arise either from the infected air, which was confined in the hold, becoming more virulent by its being shut up ? or may not the crews be rendered more susceptible of infection, after they have breathed the pure atmosphere of the ocean ? or from the combined influence of both causes acting at the same time ? It may not be irrelevant to remark, that these seamen are very slightly, and, but for a short time, exposed to the confined air below the decks (until they begin to discharge the cargoes), which in some degree affects the fore-castle, the usual place of their residence ; for they commonly prefer sleeping on deck, in the summer season, to occupying that place.

But still stronger cases have been remarked by me, which do not admit of the same objections as may be offered to the before mentioned facts : it is where the crews of vessels who were accustomed to make West India voyages, have

arrived here from sickly ports without any interruption to their health during the voyage, or the continuance of their quarantine ; while other persons employed on board with them to discharge the cargoes, have died of yellow fever, although the cargoes were in a sound state, and the vessels free from any unusual impurities. This fact certainly proves the presence of a deleterious air, that does not appear to arise from any evident cause originally in the vessels or their cargoes, but infection derived from the unhealthy port from whence they sailed, received into such vessels, and contaminating both them and the cargoes. It may be said these are only negative proofs—that the yellow fever is not generated on board by a decomposition of animal and vegetable substances—and, although not cognizable by the senses, that such decomposition is nevertheless constantly in operation.

I now ask your attention to the following observations, which may be adduced as the converse of the above stated facts, where, in many cases, animal and vegetable decomposition had taken place on board vessels from southern latitudes, yet no yellow or any other fever ensued from such causes. I have known extremely foul vessels, coming from healthy places in the West Indies, and other southern ports, at the same season of the year as those above mentioned, some of which passing through the tropics, with damaged cargoes of jerked beef in bulk, hides, coffee, and cotton, without the health of the crews being impaired ; and, I add, that other persons employed to assist in discharging and receiving these cargoes, have performed such service with impunity. In these cases there were animal and vegetable decomposition accelerated by heat and moisture, yet no yellow or malignant fever ensued. Whether these causes of disease had not been long enough operating to produce their effects, or how long a time is essentially necessary for such perishable materials to be acting on each other, before a sufficiently deleterious

air is evolved to cause pestilential fever, I am ignorant : but I have often noticed that these vessels, loaded with jerked beef and hides, which were partly damaged, had these articles long enough on board to taint the timbers and planks (those of the ceiling particularly) of the hold, to so great a degree, that after such vessels had been well scrubbed with water, and ventilated, as to remove for the time the extremely offensive smell existing in them, it has, after the application of whitewash to the planks, been reproduced to a much greater degree than it was at first ; and upon the second cleansing with lime, made a few days after, when the foul air was very much lessened, the putrid effluvia was again renewed ; which same phenomenon was repeated in a diminished degree after each whitewashing, until the vessels were purified. This obviously is the result of the chymical action of lime on putrid matter adhering to the timbers and planks, which would not have been so extricated, and thereby rendered evident, without some such agency. May we not hence with propriety infer, that contaminated air producing infectious fevers, attaches itself to the timbers and planks of vessels, although we are not acquainted with the manner in which it can be rendered apparent, and discover itself only from its effects on the human constitution ? It is on such facts and observations that the provisions of our health law, relating to the external means of preventing the introduction of infectious fevers, is founded ;—and I am persuaded that every unprejudiced person, who will deliberately reflect on them, will concur with me in opinion, that they are better adapted to guard against the introduction of infectious diseases, than that system which totally overlooks the very obvious distinction which arises between vessels arriving from healthy or from sickly ports, and that does not regard the difference of the condition of those vessels coming from cold and northern climates, or from warm and southern ones ; but confounds them all together, and places an exclusive

reliance upon the removal of those impurities that are discoverable by the senses alone.

Yours, with with great respect and regard,
JOSEPH BAYLEY.

Dr. DAVID HOSACK,
Resident Physician.

D. (See page 30.)

Communication from DR. JOHN W. FRANCIS, *Professor of Obstetrics and the Diseases of Women and Children, in the University of New-York.*

NEW-YORK, October 10th, 1820:

DEAR SIR,—In answer to your request, conveyed to me this morning, I have to state, that I distinctly recollect the conversation to which you refer. It took place about the middle of September, 1817. In the course of some observations, made by several of the gentlemen present, concerning the rapid progress of the settlements in the Western country, and the marsh fevers to which they were subject, allusion was made to the letter of the late Dr. Edward Miller, in which it is asserted, that those fevers were of the same nature and character as the yellow fever of our Atlantic cities; and Professor Ellicott was reminded, that this opinion rested principally upon the authority of his *Journal*.* Mr. Ellicott thereupon remarked, that at the time he made the observations alluded to, he had had very little acquaintance with the malignant yellow fever, as described by Dr. Rush and others; but, that subsequently he had seen much both of the pestilential fevers of New-York and Philadelphia, and of the lake or marsh fevers in different districts of the United States. He stated, unhesitatingly,

* *Journal of a Voyage, &c.* 4to.

that his present belief was, that the yellow fever and the fevers of the interior of the country, were of an entirely distinct character. He admitted, that the statements on this subject in his Journal had been incautiously made, and seemed to fear that they had been the occasion of error and mischief. I trust that nothing, herein said, will be construed to the disparagement of the late Professor Ellicott, whose talents and virtues are equally admitted by all.

Permit me, before I conclude this note, to suggest to you, in your researches into the nature of the yellow fever, a further investigation of the important, but disputed, question as to the susceptibility of the human constitution to a *second* attack of that disease. The conclusions of Pym, Fellowes, and other British writers, in support of this opinion, are founded on innumerable facts and indubitable testimony, and, so far as I have been able to learn, have been corroborated by the experience of the practitioners of this city, and of other places in the United States in which the malignant yellow fever has prevailed. In the settlement of this principle, the interests of humanity are deeply involved.

Believe me to be yours sincerely,

JOHN W. FRANCIS.

TO DAVID HOSACK, M. D. &c.

As Dr. Francis has made a reference to the immunity of the constitution from a second attack of yellow fever, it will not be irrelative to the subject of the preceding discourse, to subjoin a part of the evidence that has been adduced in support of that doctrine, at the same time that it will supply an additional argument in favour of the specific character of this form of fever as distinct from our bilious remittent and typhus fevers.

Dr. Pym, who had the advantage of seeing the disease not only in Europe but in the West Indies, contends that the Bulam, or yellow fever, attacks the human frame but once.

“ At Gibraltar,” he observes, “ during the prevalence of the disease in the years 1810, 1813, 1814, there was no well authenticated instance of a second attack: every person escaped it, who had had it at any former period: and this fact is now so well established there, that among the Quarantine regulations against the introduction of the disease this year (1815), *all the troops who have not passed it are encamped, while those who have passed it are doing the duty of the town.* At Cadiz, Carthagen, and Malaga, the fact of persons not being liable to a second attack of this disease, is considered to be as firmly established as it is in the small-pox.

“ Two more proofs of the Bulam fever not attacking a second time, were in the 70th and 55th regiments. The first suffered severely from the disease in the West Indies, in the year 1794, and returned to that climate from Europe in the year 1800, filled up with new officers, with the exception of six, viz. Col. Dunbar, Major Elliot, Captains Johnstone, Lawrence, Hutchinson, and Boat, who had had the fever at a former period in the West Indies, and who now escaped it, although the corps buried ten of the newly appointed officers in a very short time.”

“ Upon a moderate computation, there were *one hundred and fifty* officers (civil and military) at Gibraltar, who had not had the disease before, and twenty-five who had passed it in the West Indies; and making an allowance for one or two doubtful cases, where the disease was so mild as not to confine the patient to the bed, one hundred and forty-five at least out of the one hundred and fifty were attacked by it, while every individual of the twenty-five who had it before escaped it.” *Appendix to Dr. Pym's Observations.*

This same peculiarity marked the pestilential fever of Spain. According to Sir James Fellowes, it never has been known to attack the same person a second time in that country. “ This fact,” says Sir James, “ which was first observed by the native practitioners, has now been con-

firmed by the experience of several years, and by the concurrent testimony of all the surviving inhabitants of those places, where the disorder had most prevailed." *Introduction*, p. xxiii.

"The yellow fever of Andalusia," says Professor Arejula, (see the translation of his account in *Sir James Fallowes' Reports*, p. 67.) "attacks persons but once in their lives, and it is of great importance to the physician to know this, in order to form his prognosis and his plan of cure, as well as for the individual who may have passed through this disorder, that both of them being assured of this fact, may step forward without fear to the relief of their fellow creatures who may hereafter be afflicted with so dreadful a malady."

EXTRACT FROM THE REPORT UPON DR. PYM'S PUBLICATION
BY THE ARMY MEDICAL BOARD, IN WHICH THE ROYAL COL-
LEGE OF PHYSICIANS CONCURRED.

"*Army Medical Board Office, 6th May, 1816.*

"It is due to Dr. Pym to state, that we consider him to have been the first English medical man who promulgated the opinion, that the disease in question (the Bulam fever) is capable of attacking the human frame but once; and if that opinion be correct, which we believe it to be, it is certainly an important fact, and led Dr. Pym to employ those persons as attendants on the sick, who had undergone the disease, and therefore were not likely to be affected by the contagion of it, and thus probably saved many lives. Under these impressions, we beg leave to recommend the industry and research displayed by Dr. Pym in his book, to Lord Palmerstone's favourable consideration.

"Signed,

"J. M'GREGOR,

"W. FRANKLIN,

"W. SOMERVILLE."

Since the publication of the foregoing decisions of the Royal College and the Army and Medical Board, I have made the inquiry among those physicians who have been most conversant with the yellow fever, as it has appeared in the cities of New-York and Philadelphia, more especially since the year 1791, and in no satisfactory instance have I found a practitioner who has met with the disease a second time in the same individual.— During a visit made to Philadelphia, in October, 1816, I had an opportunity of conversing on this subject with the late Dr. Kuhn, the President of the College of Physicians of Philadelphia; that venerable physician informed me, that he had never seen an instance in which the same person experienced a second attack of yellow fever, and added, that in several instances, those who had been affected with that disorder, when it prevailed in Philadelphia in 1762, altogether escaped it in its late visitations, although they were exposed to the contagion in their own families, and particularly so in their own personal and unremitted attentions to the poor, particularly in the fatal epidemic of 1793. Dr. Kuhn cited, among others, the names of Thomas Penrose and William Clifton, as the most distinguished of the good Samaritans that administered to the relief of the poor on that memorable occasion.

Mr. John Vaughan, with his characteristic activity and benevolence, was in like manner exposed to the contagion during the last mentioned epidemic, and altogether escaped its influence; this exemption he believes was to be ascribed to an attack of the disease which he had, long prior to this time, suffered in Jamaica, West Indies. Dr. Wistar, the late Professor of Anatomy in the University of Pennsylvania, believed the same principle to be generally, or rather almost universally true: he had met with a few instances which he considered well authenticated cases, in which the individual suffered a second attack but such instances, he concluded, were of equally rare occurrence as a second at-

tack of the small pox, or of other diseases of acknowledged specific contagion.

Dr. William Currie, of Philadelphia, concurs in the opinion, that the yellow fever affects the human frame but once.

In an answer to a letter, recently addressed to Dr. Griffiths, of Philadelphia, the following facts are communicated to me. "Respecting the question of re-infection in the disease called yellow fever, (but which I call the ship fever of tropical climates,) my mind has been long made up. I have never seen an instance of its occurring twice in the same person, during the seven periods of its occurrence among us; and as I was absent from the city only two weeks in 1793, whilst it was prevalent, and at no other time, my opportunities of making observations of this kind were abundant."

Similar will be the result of an examination into the character of the yellow fever, as it has prevailed in New-York. Many of my fellow practitioners, who have observed the disease, have assured me, they have never attended the same individual in a second attack of it. I have personally witnessed the ravages of the pestilence during its occurrence at different years in this city, since 1795 inclusive; nor have I at any time been absent during its most alarming mortality. I suffered an attack of the disorder in 1798, and have since escaped its influence. Among the memoranda I have made of the fever of 1795, 1796, 1797, 1798, 1801, 1803, and 1805, the years it was most fatal, not a solitary case do I find of a second attack in the same person. I think we may safely and legitimately conclude, that the constitution is generally invulnerable to the operation of the contagion of yellow fever a second time.*

* For additional testimony on this subject, see also a Letter on Febrile Contagion, addressed to David Hockack, M. D. &c., by John W. Francis, M. D. 8vo. New-York, 1816.

E. (*See page 42.*)

To the evidence adduced in the preceding discourse,* to show that the decomposition of animal and vegetable substances has no agency in the production of yellow fever, I subjoin the following extracts "on the manner of burying the dead in Italy," taken from a work recently published, on the customs, manners, and political state of that country.†

From the facts therein detailed, it will appear, that if animal substances in a state of putrefaction, could engender this form of pestilential fever, that effect ought certainly to be expected in the city of Rome, the climate of which is so similar to our own. They also furnish additional evidence that burial in vaults, conducted in the manner I have recommended, may be practised without injury to the health of our city.

"All persons, who can afford it, are buried in coffins, in the vaults. These vaults are about ten feet square, and seven deep, and they are opened by means of a flat stone in the church itself. In the hot months, in those churches where the vaults are old and badly secured, and where burials are frequent, the stench is sometimes so great that the service is omitted. This is particularly true of the church della Madouna, in the Piazza del Popolo, owned by Prince Albani, and redeemed three times by him from the French for twelve thousand dollars. This prince indulges in the extraordinary charity of sending for the dead poor, and burying them in this church at his own expense. There are one hundred and seventy-one churches in Rome allowed to receive the dead, so that while the population continues in its present state, sufficient room will always be

* See page 27.

† See the Political State of Italy, by Theodore Lyman, jun. Boston, 1920. Chap. xvii. p. 210.

found in the vaults for all who can afford to be buried there.

“The poor, and all who die in charitable establishments, are thrown into pits, naked and without coffins. I went to see three pits in a small cloister behind the church of the hospital, at the head of the Corso, near the Piazza del Popolo—the most crowded and populous street of all Rome. This was on the second of January, one of the coldest days, with the clearest atmosphere, during the whole year. Nevertheless, when the flat stones, that covered the pit, just fourteen inches square, were removed, the putrid vapour arose so instantaneously, and in such thick fumes, that even the attendants moved towards the door of the cloister, till the first and most pestiferous exhalations should have passed. In the first pit there had been no deposits since the French revolution, and it then contained only a small quantity of bones—green, moist, and mostly decayed. In the second, in which there had been no burials for seven months, there was a great mass of putrid flesh, but not a body or limb, or any form or shape whatever, could be discerned. An accumulation of one hundred and twenty-two bodies, rotting, ulcerated, marked with white-blueish spots and streaks of black. As the putrid air gradually escaped, a faint sound could be heard, and the mass of corruption was observed to sink down deeper in the pit. In the last pit they were then burying, and a wretched, emaciated body, that had been thrown in that morning, was lying across the pile, with the top of its head cut off by the surgeons, and the eye-lids hanging back in a frightful manner—the hard shrunk leg of a ghastly object was slowly pressing into a swollen and inflamed body, just ready to burst—long black hair, clotted and moistened by putrid oozings, still clung to wasted skulls, where the eyes had fallen out, and the lips had shrunk away from the teeth. Some bodies had slid down to the bottom of the pit, and near the top there appeared the legs and feet of a body still sweating and swelling with decay. There were

men, women, and children, and as the mass rotted and consumed, they sunk and mixed together—a deadly yellow colour, and a thick dirty sweat, seemed to pervade and spread itself over the whole heap—a cold, sluggish oozing mingled with the slow, silent progress of putrefaction. I saw no living creature in this vault, neither worm, rat, or tarantula. A large torch, burning with a full blaze, expired instantly, three times, on being put into the mouth of the pit.

“ The largest hospital in Rome is the Santo Spirito, and it has one hundred and thirty-six pits dug on the top of a hill, a quarter of a mile from the city. There are thirty-six pits belonging to the hospital of St. John. From the beginning of this century to the end of the year 1818, there have died in Rome, in charitable establishments, a yearly average of two thousand one hundred and thirty persons—to these add eight hundred and seventeen persons dying in houses, but buried at the public expense, making annually two thousand nine hundred and forty-seven individuals buried in pits and without coffins. Each burial cost one dollar and sixty cents, for transportation, wax lights, and the mass—circumstances never neglected, though the body itself should be dragged to the pit with hooks and thrown upon the pile as if it was carrion. Such is Christian burial !”

END.

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